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Personal fall protection equipment - Retractable type fall arresters

Persönliche Absturzschutzausrüstung - Höhensicherungsgeräte

Équipement de protection individuelle contre les chutes de hauteur - Antichutes à rappel automatique

Ta slovenski standard je istoveten z: EN 360:2023

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| | | |
|-----------|-----------------------------|---|
| 13.340.60 | Zaščita pred padci in zdrsi | Protection against falling and slipping |
|-----------|-----------------------------|---|

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Personal fall protection equipment - Retractable type fall arresters

Équipement de protection individuelle contre les chutes de hauteur - Antichutes à rappel automatique

Persönliche Absturzschutzausrüstung - Höhensicherungsgeräte

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European foreword

This document (EN 360:2023) has been prepared by Technical Committee CEN/TC 160 “Protection against falls from height including working belts”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2024, and conflicting national standards shall be withdrawn at the latest by June 2025.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 360:2002.

The significant technical changes between this document and the previous edition are described in the informative Annex C.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

For the relationship with EU Legislation, see informative Annex ZA, which is an integral part of this document.

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

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1 Scope

This document specifies requirements, test methods, marking, manufacturer's instructions and information for retractable type fall arresters (RTFAs) and applies to a RTFA with a single retractable lanyard and a RTFA with two retractable lanyards (twin RTFA) as components of one of the fall arrest systems covered by EN 363:2018.

This European standard is not applicable to RTFAs and twin RTFAs used in any sport or recreational activity.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 358:2018, *Personal protective equipment for work positioning and prevention of falls from a height — Belts and lanyards for work positioning or restraint*

EN 361:2002, *Personal protective equipment against falls from a height — Full body harnesses*

EN 362:2004, *Personal protective equipment against falls from a height — Connectors*

EN 364:1992, *Personal protective equipment against falls from a height — Test methods*

EN 365:2004, *Personal protective equipment against falls from a height — General requirements for instructions for use, maintenance, periodic examination, repair, marking and packaging*

EN 10277:2018, *Bright steel products — Technical delivery conditions*

EN 10278:1999, *Dimensions and tolerances of bright steel products*

EN ISO 683-1:2018, *Heat-treatable steels, alloy steels and free-cutting steels — Part 1: Non-alloy steels for quenching and tempering (ISO 683-1:2016)*

EN ISO 9227:2022, *Corrosion tests in artificial atmospheres — Salt spray tests (ISO 9227:2022)*

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3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org>

3.1

retractable type fall arrester

RTFA

fall arrester with a self-locking function and an automatic tensioning and return facility with one retractable lanyard.

Note 1 to entry: Figure 1a shows an example of a RTFA.

Note 2 to entry: Figure 2a, Figure 2b and Figure 2c show directions of use.

Note 3 to entry: An energy dissipating element may be in or at the housing of the RTFA and/or part of the retractable lanyard.

Note 4 to entry: An RTFA that includes a feature to manually prevent only extraction may require additional testing, e.g. to EN 358.

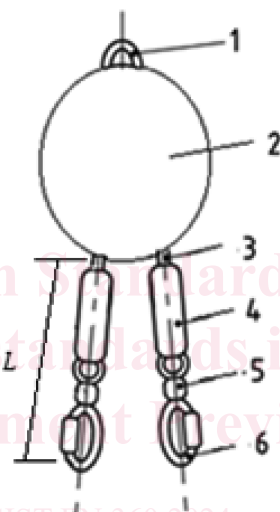
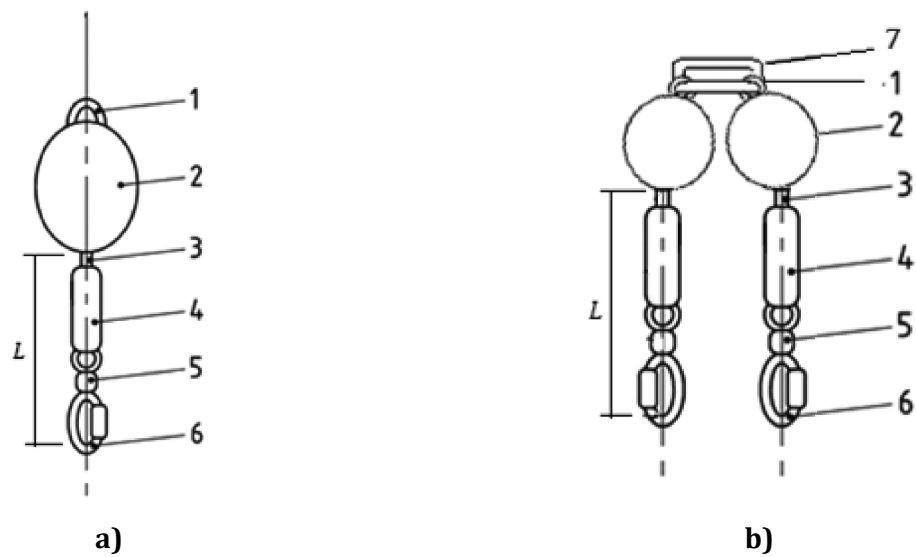
3.2

twin RTFA

fall arrester with a self-locking function and an automatic tensioning and return facility with two retractable lanyards

Note 1 to entry: Twin RTFAs may be two independent devices connected together or may be two retractable lanyards integrated into a single housing. See Figure 1b and Figure 1c.

Note 2 to entry: An energy dissipating element(s) may be in or at the housing of the twin RTFA and/or part of the retractable lanyards.



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Key

| | | | |
|---|-------------------------|---|--|
| L | non-retractable section | 4 | energy dissipating element (if applicable) |
| 1 | attachment point | 5 | swivel |
| 2 | housing | 6 | connector or connection element |
| 3 | retractable lanyard(s) | 7 | permanent connection element |

Figure 1 — Examples of RTFAs with one or two retractable lanyards

3.3**retractable lanyard**

connecting element of a RTFA, which may be of wire rope, man-made fibre webbing or man-made fibre rope and may include an energy dissipating element

Note 1 to entry: A retractable lanyard may be any length.

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3.4

man-made fibre

fibre obtained by a manufacturing process

Note 1 to entry: Man-made fibres refer to CEN ISO/TR 11827:2016.

3.5

energy dissipating element

element of a RTFA, which is designed to dissipate the kinetic energy developed during a fall from a height

3.6

braking force

maximum force F_{\max} measured during the dynamic performance test

Note 1 to entry: Braking force is expressed in kilonewtons.

3.7

arrest distance

H_{AD}

vertical distance measured from the initial position of the test mass before its release in a dynamic test to its final position after arrest

Note 1 to entry: Arrest distance is expressed in metres.

3.8

distance beneath anchor

H_{BA}

vertical distance measured from the anchor point on the test apparatus to the connection point of the RTFA to the load cell at its final position after arrest

Note 1 to entry: Distance beneath anchor is expressed in metres.

3.9

minimum rated load

minimum mass of the person, excluding any tools and equipment carried, when using the RTFA, as specified by the manufacturer

Note 1 to entry: Minimum rated load is expressed in kilograms.

3.10

maximum rated load

maximum mass of the person, including any tools and equipment carried, when using the RTFA, as specified by the manufacturer

Note 1 to entry: Maximum rated load is expressed in kilograms.

3.11

connection element

integral element of the RTFA permitting connection between the RTFA and the appropriate fall arrest attachment point on the suitable full body harness, e.g. a harness conforming to EN 361:2002, and/or the anchor point

4 Requirements

4.1 Design and ergonomics

4.1.1 When checked in accordance with 5.3.5 the retractable lanyard(s) shall fully retract.

4.1.2 When checked in accordance with 5.1.1, the non-retractable section of the retractable lanyard(s) (e.g. energy dissipating element, connector), including the largest permissible connector or connection element specified by the manufacturer's instructions and information, shall have a maximum length L of 600 mm (see Figure 1).

4.1.3 When checked in accordance with 5.1.1, if the weight of the RTFA or twin RTFA is 15 kg or more its weight shall equal that marked on the device to the nearest 0,5 kg.

4.1.4 When checked in accordance with 5.1.2, a twin RTFA shall have lanyards of equal length and with either lanyard fully extracted the maximum length L_{\max} (see Figure 3) shall not exceed 2,5 m.

4.1.5 If the manufacture permits two independent RTFAs to be used as a twin RTFA they shall be tested in accordance with 5.1.2, with either lanyard fully extracted the maximum length L_{\max} (see Figure 3) shall not exceed 2,5 m.

4.1.6 If the manufacturer permits use of the RTFA or twin RTFA in a Mobile Elevating Work Platform (MEWP) it shall additionally meet the requirements of normative Annex A.

4.1.7 If the RTFA or twin RTFA includes a feature to limit extraction of the retractable lanyard the RTFA or twin RTFA shall additionally conform to relevant requirements of other standards or specifications, e.g. EN 358:2018, with the feature engaged. The RTFA or twin RTFA shall not include a feature or features which limits retraction of the lanyard.

4.2 Materials and construction

4.2.1 When checked in accordance with 5.1.1, materials used in the RTFA and twin RTFA that may come into contact with the skin of the user including the retractable lanyard shall not be known to cause irritating or sensitization effects when used as intended.

4.2.2 When checked in accordance with 5.1.1, the retractable lanyard(s) shall be a wire rope, a man-made fibre webbing, man-made fibre rope or a hybrid with a man-made content.

NOTE 1 A retractable lanyard(s) can include a non-load bearing covering material, e.g. non-metallic sheath.

NOTE 2 A hybrid retractable lanyard(s) can be a combination of man-made fibre and metallic elements.

4.2.3 When checked in accordance with 5.1.1, wire ropes for retractable lanyards shall be made either from stainless steel or galvanised steel. Terminations (e.g. a swaged ferrule) for a retractable lanyard made from wire rope shall be made from a metallic material and not known to cause an adverse reaction with the material of the wire rope (e.g. dissimilar metal corrosion, cracking).

4.2.4 When checked in accordance with 5.1.1, webbing or fibre rope and sewing threads for retractable lanyards shall be made from man-made fibres with a tenacity of at least 0,6 N/tex.

NOTE 0,6 N/tex is based on the information given in EN ISO 9554:2019, Annex A.

4.2.5 When checked in accordance with 5.1.1, exposed edges or corners of elements shall be relieved either with a radius of at least 0,5 mm or a chamfer of at least 0,5 mm × 0,5 mm.

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4.2.6 When checked in accordance with 5.1.1, the termination of the retractable lanyard(s) and the attachment point (see Figure 1) shall be designed such that they either incorporate a connector conforming to EN 362:2004, 4.1 to 4.5, or are of such a design that an EN 362 connector can be fitted or they shall incorporate a specific connection element (e.g. for attachment to a full body harness, tripod) which shall be so designed that it cannot be disconnected unintentionally and shall require at least two different deliberate manual actions to disconnect.

4.2.7 When checked in accordance with 5.1.1, the RTFA shall be fitted with a fall indicator.

A RTFA may have more than one fall indicator.

4.2.8 When checked in accordance with 5.1.1, the twin RTFA shall be fitted with a fall indicator in the connection element, in or at the housing(s) or in each retractable lanyard.

4.2.9 When checked in accordance with 5.1.1, U-bolt clamps including those conforming to EN 13411-5 shall not be used to form a termination in the retractable lanyard made from wire rope.

4.3 Retraction tension and function

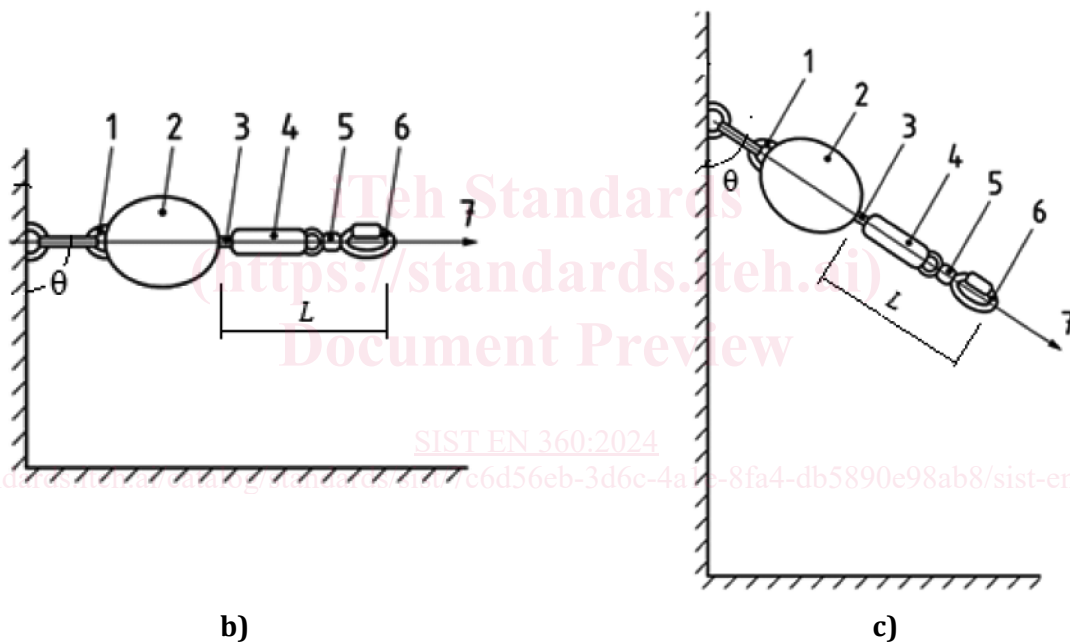
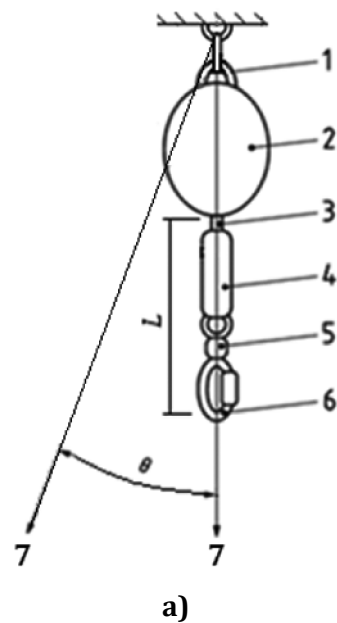
4.3.1 When tested in accordance with 5.3.2, for vertical applications where the maximum angle θ from the true vertical is not greater than 45° (see Figure 2a), the retraction tension in each lanyard shall not be less than 5 N or more than 110 N and the lanyard(s) shall fully retract to its original position without stopping.

4.3.2 If the manufacturer permits use in a horizontal application or where angle θ from the true vertical is greater than 45° (see Figures 2b and 2c) the RTFA and twin RTFA shall be tested as described in 5.3.3 and the lanyard(s) shall fully retract to its original position without stopping.

4.3.3 For twin RTFAs and for RTFAs where the manufacturer permits attachment of the RTFA housing, i.e. not the retractable lanyard, to the attachment point of the harness, when tested in accordance with 5.3.4 the lanyard(s) shall fully retract to its original position without stopping.

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**Key**

| | | | |
|-----|--|----------|-----------------------------|
| L | non-retractable section | 5 | swivel |
| 1 | attachment point | 6 | connector |
| 2 | housing | 7 | additional direction of use |
| 3 | retractable lanyard | θ | angle from true vertical |
| 4 | energy dissipating element (if applicable) | | |

Figure 2 — Examples of directions of use for a RTFA attachment

4.4 Static strength

4.4.1 RTFAs and twin RTFAs with a retractable lanyard(s) material entirely of man-made fibre rope or man-made fibre webbing or which is a hybrid with a man-made content shall sustain a load of at least 15 kN when tested as described in 5.4.2.2.

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4.4.2 RTFAs and twin RTFAs with a retractable lanyard(s) material entirely of wire rope shall sustain a load of at least 12 kN when tested as described in 5.4.2.2.

4.4.3 If any load-bearing element other than the retractable lanyard(s) of the RTFA or twin RTFA, e.g. an energy dissipating element, is made from non-metallic materials it shall sustain a load of 15 kN when tested in accordance 5.4.2.3.

4.5 Dynamic tests**4.5.1 General****Table 1 — Overview of applications and product related tests**

| Dynamic tests | Attachment(s) | | | | |
|--|---------------------------------------|---|---|--------------|------------------------------------|
| | Overhead (vertical application) | Foot Level (horizontal application) | Foot Level (vertical application) | Twin RTFA | MEWP (RTFA and twin RTFA) |
| Performance 4.5.2, function 4.5.3 and strength 4.5.4 (overhead attachment, vertical application) | ✓ | ✓ | ✓ | ✓ | ✓ |
| Performance 4.5.5, strength and integrity 4.5.6 (foot level attachment, horizontal application) | × | ✓ | × | ○ | × |
| Dynamic performance 4.5.7 (foot level attachment, vertical application) | × | × | ✓ | ○ | × |
| Dynamic performance 4.5.8 (horizontally opposite arrangement) | × | × | × | ✓ | × |
| Dynamic performance and integrity A.2.4 (foot level attachment, MEWP application) | × | × | × | ○ | ✓ |
| Key ✓ required × not required ○ required if use is claimed by the manufacturer | | | | | |

NOTE 1 For devices that are intended for multiple attachments, select all columns that are applicable.